

THE ORGANIZATION AND MANAGEMENT OF
TRADE SCHOOLS,
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AN ADDRESS

ON THE

ORGANIZATION AND MANAGEMENT OF TRADE SCHOOLS

BY

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ORGANIZATION AND MANAGEMENT OF TRADE SCHOOLS

I am to speak to you to-day on the organization and management of trade schools. It is a pleasant subject, because as a rule, the young men who are being trained in a properly conducted school of that type take great interest in their work, and are so enthusiastically devoted to it that their progress is wonderfully rapid and gratifying.

Time will permit me to refer to only a few of the most important details involved in the foundation and administration of such schools.

Boys generally are insufficiently developed mentally and physically to enter vigorously on trade work with the tools and appliances used by journeymen before the age of sixteen years, seventeen being probably better still, while eighteen is not undesirable.

If a school proposes to graduate journeymen (and my article is based on that supposition) the pupils must be sufficiently matured physically and mentally on graduation to do men's work. They must have the appearance as well as the qualities of manhood to merit a man's pay. No matter what plan may be adopted for teaching trades this is a most important consideration, and must not be overlooked.

I will not enter on the question of earlier preparatory training for such schools as I have in mind, but undoubtedly such preparation is to be commended.

The most difficult question in this whole matter is that of securing qualified pupils of the proper age, and retaining them in schools until the close of their apprenticeship. In the school with which I am connected this difficulty has been

eliminated by some favorable conditions. The continuous interest of the pupils in well-graded instructional exercises is so great, however, that very little disposition is manifested to withdraw from the school before the completion of the full course.

Candidates should be examined physically and academically, and their general fitness and desirability ascertained from references, and by personal interviews, and no one should be accepted as a pupil who has not a positive intention of beginning his business career as a workman at the trade which the school will teach him. That this is practicable is shown by the fact that as high as 98 per cent. of the members of a class of our school have, on graduation, immediately started as journeymen at the trades taught them.

Young men sometimes have a fancy for vocations for which they are mentally and physically unfitted, and an important duty of those in charge of trade schools is to decide what trades are best for applicants, and, if necessary, endeavor to convince them of the soundness of their decisions. Failing in this the candidates should not be accepted, as it is generally unwise to undertake to train young men for trades which they dislike, and just as wrong to put them to one for which they are unqualified. As a rule, however, very few fail in trades for which they have a fondness, but if after a moderate trial any should be found unfitted for their vocations, they should be dropped from the roll.

Generally the average boy can succeed at any one of several trades. A long experience in the matter indicates that the trade should be fixed at the beginning of the school course, otherwise valuable time is lost in experimenting, and uncertainty and disagreement on the subject are quite likely to follow.

The courses must be of sufficient length to include well graded and thorough instruction in the practice, as well as, the theory of trade work, with proper collateral academic training, especially in mathematics and mechanical drawing. As one mechanical process is mastered it should at once be succeeded by another. This advancement, and the knowledge that the sole object of the instruction is to benefit the pupils, adds greatly to their interest in their work.

Time must be given to enable the pupils to properly absorb or assimilate what is taught them, and in most trades three years is not too long for this purpose. A certain moderate time should be devoted to culture studies such as Physics, Elementary Chemistry, Civil Government, Literature, etc. A man may be a carpenter and murder the King's English, and a physician may give you medical advice without being familiar with the history of his country, but both would be better equipped for life's services and enjoyments with the wider training.

The larger mental culture will give increased general intelligence to our young mechanics, making them better workmen and enhancing their prosperity.

We should do whatever will help their progress and development in the line of their work and add to their happiness, and it is, therefore, our duty to deal liberally with them in their training, bearing always in mind the importance of good citizenship as well as mechanical efficiency.

Some may think that giving a young mechanic a fair general education will lead him away from his vocation. Similarly some years ago prominent manufacturers feared that any training in trade schools would largely result in spoiling the boys, or as one expressed it: "They will be unwilling to work with their shirt collars off." If either of these untoward effects should follow, it will be the fault of the *school management*, and not the system.

When the mind and hands are working in unison the interest in labor does not diminish but it increases.

Prof. Davenport, Dean of the College of Agriculture, University of Illinois, well expresses the thought I have in mind, when he says: "There is no higher duty resting upon all of us than to see to it that no individual shall be compelled to choose between an education without a vocation, and a vocation without an education—I would have it so that the occupation of an American citizen may not be known by his dress, his manner, his speech, or his prejudices."

In illustration of this phase of the subject allow me to repeat the following anecdote:

Some years ago Dr. D. Hayes Agnew, the eminent surgeon, whilst waiting in the parlor of a Philadelphia residence for another physician, noticing how substantial and attractive the house was, said to the owner, "You have a delightful and well built home," to which the gentleman replied, "I am glad you are pleased with it especially as I built it myself." He further explained that his father was a bricklayer who had two sons, and feeling that his life had been somewhat hampered by lack of early educational advantages, he determined to give his boys a college training. The eldest finished his course at Princeton with credit and became a lawyer. The youngest (the owner of the house) also had an honorable career at the same University, and when he returned home after graduation his father said, "My son, I have made it possible for you to obtain an excellent education, but that is all I can give you, and you must now decide what occupation to follow." The reply was, "Father, let me have two days to think the matter over." At the end of the time he said, "Father, bricklaying sent me to Princeton and I will be a bricklayer." Continuing, he remarked, "I began at the foot of the ladder as an apprentice, finished my time, became a jour-

neyman, then a foreman, and afterwards a contractor. I built this home and other houses, and now my rents from the latter have made me independent financially, and I can work or not as I please." Dr. Agnew said that this interview with a cultured gentleman engaged in an occupation, which before had seemed to him common, vastly increased his appreciation of the dignity of labor.

Returning to the trade exercises we must insist that they be very comprehensive, qualifying the apprentices to readily cope with the practices and problems involved in commercial work. This is entirely practicable, and it is pleasing to note the comparative ease with which young men thus trained can apply their knowledge and skill to the varying conditions of the business world.

The mechanical drawing after the elementary exercises, must directly pertain to the specific trades.

Throughout the entire course the leading feature of the training must be the mechanical, whilst the academic instruction, especially in mathematics and drawing, must have a well defined connection with trade work. I repeat, the dominant tone of the school must be the shop instruction, the academic being auxiliary to it. Trades can be taught best in schools especially devoted to that work, rather than in those in which they are merely adjuncts to general education.

Pupils must be taught to work speedily but never at the expense of accuracy which must always be insisted on, and time cards should be used whenever practicable, as they are an incentive to industrious application. Speed exercises are of advantage especially in the closing year. The value of materials must be constantly kept before them, so that they may be economical in their use, and estimating costs should be a part of the instruction.

The earlier and simpler trade exercises must be combined in more complex problems towards the end of the course. The school day should be eight hours long on five days of the week, and about three hours on Saturday, divided equally for a while between trade and academic studies. During the last six months of the apprenticeship the whole day should be spent on mechanical exercises. This adds to the ease of the transition to commercial fields. There is no difficulty in maintaining satisfactory continuing interest during days of the length indicated.

There seems to be no limitation as to what trades can be taught in schools, even chimney sweeping being included in the German curriculum.

As it is easier for graduates to obtain employment nearer home than at a distance, the trades embraced in a school's course must be governed to some extent by its environment, though some are of such a general nature, as carpentering, plumbing, etc., that they may be taught almost everywhere.

American trade school graduates have already found profitable employment in foreign countries.

It is of great importance that employers should not induce school apprentices to abandon their course before graduation, to enter on commercial work. Those of us who have had experience with the shop system know how it has suffered from apprentices failing to complete their time because of some wage temptation offered by other employers.

Whatever may be our opinion of strikes it follows as a matter of course that under no circumstances should schools be used as strike-breakers. When trade schools become general there will be fewer strikes.

The shops must be well equipped with tools and appliances embodying the types of those the pupils will handle after graduation.

The mechanical teachers must be masters of their respective trades, of good general education, well versed in mechanical drawing and mathematics, and be capable of readily imparting their skill and knowledge to their pupils. Such instructors are scarce, but they can be had, and the supply will increase as trade schools multiply. It will not answer to have school men with a limited practical knowledge of trades as mechanical teachers. Trade teachers should never work on pupil's exercises, or put finishing touches on them. Let them be the sole product of the apprentices' efforts. This will be educationally helpful to them, and enable those interested to judge accurately of the results of the school's efforts.

Teachers should have opportunities from time to time to visit leading outside shops, and by study of books and papers pertaining to their trades, keep abreast of the times.

Each trade should have its own expert teacher, and no teacher should have charge of more than one trade. Mechanical teachers should have good salaries. Some rate their value too low.

It is very desirable to have on the managing Boards of Trade Schools, representatives of mechanical avocations. Such schools should stick close to their object, viz.: "to train journeymen mechanics," and not be led by ambition to stray into other fields. They must constantly impress on their pupils that the purpose of their training is to fit them for work as journeymen, and that they must not expect on graduation to be employed at once as foremen, superintendents, etc., though these positions may come to some of them later.

It naturally follows from what has been stated that all trade school work should be instructional, and that nothing should be made for sale. That would make it necessary to keep the pupils at processes with which they are quite familiar, otherwise the products would be unsaleable. To manu-

facture for the market would not be scholastic, neither should schools be run as competitors of legitimate business enterprises, or paid labor.

Employers are sometimes unfair to trade school graduates. Let me illustrate this by one example. Some years ago two young men graduated from a trade school as pattern makers. One, the more intelligent and skilful of the two, unwisely applied to a concern which does not believe in the school plan. He was asked where he had worked, and replied that he was a trade school graduate, and was then told that he could not be given more than \$8 per week for a beginning, and would be expected to work for two years before receiving full wages. Foolishly he agreed to this. The second one obtained work in a jobbing pattern shop for \$12 per week, and after being there about six weeks applied for work at the manufactory where No. 1 was employed, giving the address of the place where he had been, but making no reference to his apprenticeship. He was told to come to work and his wages would be fixed at the end of the first week, when he would be paid in accordance with his worth. When he received his pay envelope he found he was rated at \$18.00 per week, over twice as much as his brighter classmate was receiving in the same room and on the same work. Fortunately, nowadays such employers are becoming exceptional, most of them placing high value on trade school graduates.

Graduates from all vocational schools, be they trade schools, technological institutes, normal schools, colleges or universities, will continue to learn after they have finished their course at their Alma Mater. Some of us who have been in the harness many years are still adding to our store of knowledge and efficiency.

It is claimed by some that graduates in professional lines are not teachers, physicians, lawyers, engineers, architects,

etc., when their prescribed instructional courses are completed in good institutions of learning, nevertheless no educator would recommend the abandonment of the methods used in them. The ease with which practice and theory can be combined in trade schools makes it less difficult to teach trades in such schools than some professions in colleges. I submitted the question to a prominent dentist, a graduate of the Dental Department of the University of Pennsylvania, by asking him what became of young men or women who had been trained for dentistry in a reputable college. He answered, "They practice their profession." I said, "You consider them dentists?" He answered, "Of course, I do." I asked him if it were not necessary to spend a considerable time in the office of an established practitioner before entering on professional work, and he said, "Undoubtedly no." I mention this profession particularly because it is so largely dependent on mechanical skill for excellence.

It would be foolish to claim that a school graduate with a good theoretical, but little practical knowledge of his trade, graduates as a journeyman, and I will again urge the importance of having sufficient trade practice in schools. With a course of ample length this practice can be given with wonderful efficiency, provided the exercises are sufficiently wide in scope and in thoroughness.

It is not my province to exploit the school with which I am connected, but I must mention it so that you may see that there is a solid basis for my opinions. In periods of normal business it cannot begin to meet the demand for its graduates as journeymen at fair wages. They are regularly employed as such by manufacturers and contractors, who have not the slightest special interest in our enterprise, but they are hired simply because they make very desirable and profitable employees, and let me add they rapidly become the highest grade journeymen in the shops in which they work.

Take the trade of bricklaying, one which specially requires great dexterity and endurance, and frequently our graduates in it obtain the highest wages during their first season. This would be simply impossible if they left us otherwise than journeymen.

After an experience of nearly twenty-one years as a manufacturer with hundreds of apprentices in the trades of blacksmithing, pattern making, moulding and machine work, and an added knowledge of twenty years trade school work with nearly twelve hundred pupils and almost seven hundred graduates in the trades of bricklaying, carpentering, machine work, pattern making and stationary engineering, I unqualifiedly assert that trades can be satisfactorily taught in schools. With us at Williamson this is not an inference or a theory, but a well demonstrated fact. The truth of the matter is, that there is no mystery in teaching trades in schools, and when the subject is approached in a mechanical and business-like manner, and handled in a simple rational way, satisfactory results are sure to follow. Those of us who have labored sympathetically and earnestly in this direction know that it is not difficult to train in schools young men to be thinking mechanics with fine practical skill. This is corroborated by the experience of some of the best trade schools of Belgium and Holland.

President Eliot of Harvard writing on this subject says, "The apprentice system has been in past centuries, and still is to some extent, an unjust and imperfect method. It is a slow and wasteful way of learning a trade and liable to great abuses. Any bright and diligent youth can learn a deal more in three years at a good trade school than in seven years of apprenticeship."

In comparing the quality of the work being done in foreign trade schools with that of the American schools there

is a tendency to underrate the latter. In that connection it seems to me advisable to give the opinion of Prof. Omer Buyse, an intelligent leader in vocational training in Belgium. In a comprehensive work just published on the methods of American mechanical schools, based on his personal inspection of many of them, he says, that "The Williamson School eclipses all similar institutions in Europe."

I would further remark on this phase of our subject, that it was my privilege last summer to visit some European trade or vocational schools, and I make bold to say that the results being achieved there, particularly in Germany, are not so much because of the specially high grade of instruction in mechanical lines, but because they are doing something, and probably the best that circumstances will permit. Furthermore, there is unity of sentiment and action; the government, the schools, the manufacturers, and the trade unions or guilds being in full accord. I think the tendency there is to throw an increased share of the responsibility on the schools, rather than on the shops. Indeed, Dr. George Kerschensteiner, in charge of the Munich mechanical schools, who is thought to be the leading German authority in such matters, said to me, "A shop or factory cannot produce a good mechanic. Nearly all of them lack sufficient variety in scope or range, and quality of work to enable them to do so. Furthermore, many of them are not prepared to impart to their apprentices what they know themselves." Of course, in making this statement he only referred to conditions in his own country.

It was my good fortune to see at the Munich Exposition a very large and interesting exhibit of the product of the mechanical schools of that city, which embrace numerous trades. It was altogether on instructional lines, no article for sale being made in the Munich schools.

The Franco-British Exposition has a fine exhibit of the work of the French mechanical schools, showing especially the progressive instructional exercises used in the machine trade. Instruction seems to be the basic principle of both the French and German trade schools.

When parents and employers generally learn the splendid possibilities of trade training in thoroughly organized and carefully administered trade schools, there will arise a great demand from them for such institutions. Such schools will so dignify handicrafts that the fathers and the mothers of the future will consider them of a class with the colleges and technical schools when deciding what training to give their children. They will realize that as fine opportunities are open for skilful mechanics, as for those trained in the professions.

There are other ways to teach trades than the one outlined in this article, such as the regular shop apprenticeship system, the same system with academic instruction in connection with the shop, or with academic instruction in outside schools, or academic instruction in schools with mechanical work in manufactories. Our main reliance for trade instruction in the United States must be upon our public school system.

Social and financial conditions are such that for the present all must have a share in the good work, and there should be no contention between the advocates of the various plans. It is important in this connection that our Society should not underrate trade instructions wherever given, and let us urge that it be thorough, however imparted. There may not be entire agreement in methods, but I think that we are in accord in our ideals.

Some trades under existing conditions may, for the present at least, require different treatment from others, but for the trades with which I am familiar, I believe the one ad-

vocated in this paper to be the best. The thoroughness of our work is shown in various ways. Take, for instance, the machine trade. Our graduates in that department are efficiently employed in building locomotives, cars, typesetting machines, stationary engines, automobiles, machine tools, dynamos, motors, general electric machinery and appliances, steam pumps, gas engines, elevators, etc., and are also to be found in shipyards, steel works, railroad shops, etc.

Hundreds of instances could be given of the fine results of training such as I have outlined, but I will mention only one. In a letter just received from a bricklaying graduate of this year's class, who is earning \$5 per day and is a member of the Union, he writes: "I wish to express my sincere gratitude for the kind and logical instruction, which I received at the Williamson School. My graduation is a matter of great satisfaction to me, as I am confident the instruction I received there, enables me to hold the position I have had during the past few months. Many times I thought the lessons assigned were hard and difficult, but now I realize they were only stepping stones to a higher, better and broader plane in this business world of ours." I have given this extract to show the appreciation of broad and generous training by one who has experienced its beneficial effects in his trade work.

Dr. Channing, in an address delivered before a Mechanics' Institute, in 1838, expresses the thought I have been endeavoring to convey in another form. He says: "I have now given a few views on the culture, the improvement, which every man should propose to himself. I have all along gone on the principle that a man has within him capacities of growth which deserve and will reward intense, unrelaxing toil. I do not look on a human being as a machine, made to be kept in action by a foreign force, to accomplish an unvarying succession of motions, to do a fixed amount of work, and

then to fall to pieces at death, but as a being of free spiritual powers; and I place little value on any culture but that which aims to bring out these, and to give them perpetual impulse and expansion.

“I am aware that this view is far from being universal. The common notion has been, that the mass of the people need no other culture than is necessary to fit them for their various trades; and, though this error is passing away, it is far from being exploded. But the ground of a man’s culture lies in his nature, not in his calling. His powers are to be unfolded on account of their inherent dignity, not their outward direction. He is to be educated because he is a man, not because he is to make shoes, nails, or pins. A trade is plainly not the great end of his being, for his mind cannot be shut up in it; his force of thought cannot be exhausted on it. He has faculties to which it gives no action, and deep wants it cannot answer.”

In conclusion I would say we must not only prepare trade school graduates by their knowledge, skill and efficiency to earn a comfortable living and a surplus, but teach them to so live physiologically, mentally, morally and spiritually, that they will have sound minds in sound bodies, and be capable of rendering their fair share of services in all the higher activities of life, a blessing not only to themselves, but to their fellow creatures.

